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Form Approved
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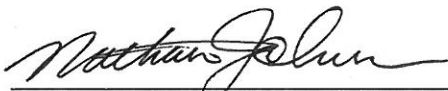
1. REPORT DATE (DD-MM-YYYY) 05/16/2014		2. REPORT TYPE Study		3. DATES COVERED (From - To) February 2013 - May 2014	
4. TITLE AND SUBTITLE Doxycycline Compliance at Bagram Air Field				5a. CONTRACT NUMBER N/A	
				5b. GRANT NUMBER N/A	
				5c. PROGRAM ELEMENT NUMBER N/A	
6. AUTHOR(S) Johnson, Nathan H., Malone, Debra L., Hubbard, Cameron L, Steele, Nancy M.				5d. PROJECT NUMBER N/A	
				5e. TASK NUMBER N/A	
				5f. WORK UNIT NUMBER N/A	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) 10th Medical Group 10th Medical Support Squadron Clinical Laboratory Flight United States Air Force Academy, CO, 80840				8. PERFORMING ORGANIZATION REPORT NUMBER N/A	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) 10th Medical Group 10th Medical Support Squadron Clinical Laboratory Flight United States Air Force Academy, CO, 80840				10. SPONSOR/MONITOR'S ACRONYM(S) 10 MDSS/SGSL	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S) N/A	
12. DISTRIBUTION/AVAILABILITY STATEMENT Distribution A: Approved for public release; distribution unlimited.					
13. SUPPLEMENTARY NOTES This effort was approved by the Garrison Commander, Bagram Airfield and certified and approved as a performance improvement project by the Executive Steering Committee of the Joint Combat Casualty Research Team on 27 March 2013					
14. ABSTRACT Doxycycline compliance is an essential medical consideration for Commanders and medical personnel in the deployed environment. In current and previous conflicts in malaria endemic areas, malarial infection is a detriment to military personnel's health and consequently mission success. It is well known that no matter how efficacious a countermeasure for malarial infection may be, personal failure to comply with medication administration negates its effectiveness. This performance improvement project demonstrated that doxycycline compliance was less than optimal at Bagram Air Field. In addition, this project highlights the need for exploration/research to improve doxycycline compliance in military personnel.					
15. SUBJECT TERMS Doxycycline, malaria, Afghanistan, side-effect, compliance,					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Colonel Nathan H. Johnson
U	U	U	SAR	32	19b. TELEPHONE NUMBER (Include area code) 937-684-7766

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Doxycycline Compliance at Bagram Air Field

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Abstract

Doxycycline is a common antibiotic prescribed to United States (U.S.) Military personnel for the prevention of malaria in endemic areas to include Afghanistan. Compliance with malaria chemoprophylaxis is especially critical considering that the World Health Organization reports that Afghanistan has the fourth largest worldwide malaria burden of non-African countries and the second highest in the Eastern Mediterranean Region.¹ There is a long history of non-compliance with malaria chemoprophylaxis by military personnel. Published compliance rates from recent military deployments have ranged from 30% to 56%.^{1, 7-10} These low compliance rates are not compatible with good military order and discipline. For example, in 2005, the rate of malaria infection among one equipment platoon in Afghanistan was 53%. Considering these earlier reported rates of Malaria in deployed settings, the purpose of this performance improvement project was to examine more current (2013) compliance of military members. The study targeted military members deployed to Bagram Air Field Afghanistan in an effort to determine adherence to prescribed malaria chemoprophylaxis

Background

Doxycycline is a common antibiotic prescribed as malarial prophylaxis to U.S. Military personnel deployed to areas where malaria is endemic such as Afghanistan.^{1,2} Each year, numerous military personnel are infected by the parasites that cause malaria, primarily *Plasmodium vivax*, during their service in Afghanistan.³ Therefore, compliance with malaria chemoprophylaxis is very important. The World Health Organization (WHO) reports Afghanistan has the fourth highest worldwide malaria burden of non-

African countries and the second highest in the Eastern Mediterranean Region.⁴

Individuals from the U.S. have historically high percentages of prescription non-compliance.⁵ Lack of compliance has been called “America’s other drug problem” and costs the U.S. more than \$170 billion annually in direct and indirect health care costs.⁶ In the military setting, lack of malaria chemoprophylaxis can be detrimental to operational readiness and prevent critical missions from being accomplished.¹ There is a long history of non-compliance with malaria chemoprophylaxis by military personnel. Published compliance rates from recent military deployments have ranged from 30 to 56%.⁷⁻¹⁰ Such compliance rates are incompatible with good military order and discipline. For example, in 2005, the rate of infection among one U.S. equipment platoon in Afghanistan was 53%.¹¹

Despite the scientific advances and knowledge of non-compliance with malarial prophylaxis, the military efforts to encourage compliance are somewhat discouraging. During the 13 years that the U.S. has deployed military personnel to Afghanistan, there have been approximately 100 cases of malaria reported annually.¹² There are several possible reasons to explain this high number of infections to include lack of availability of doxycycline during periods of deployment, non-compliance with doxycycline, and failure of leadership to enforce and emphasize prevention measures.¹¹ Personal reasons for non-compliance include forgetting to take the medication, unwanted side effects, lack of medication, and a disdain for taking pills.¹¹ Studies demonstrate that when military leadership continuously emphasizes the importance of medication compliance, the rates of non-compliance due to patient forgetfulness decreases.

Continued compliance despite adverse side effects may be accomplished by ensuring patient knowledge of possible effects and reasonable ways to mitigate these medication side effects.¹ The impact of patient knowledge pertaining to the side effects of doxycycline and proper administration of medication have not been studied extensively, especially in military populations. Medication side effects that may impact patient compliance include abdominal pain, nausea, loose stools, vomiting, loss of appetite, yeast infections, and rash.¹³ There are numerous dietary contraindications with doxycycline intake. For example, iron binds to doxycycline creating a chelated complex resulting in decreased intestinal absorption.¹⁴ Iron is frequently prescribed to females for supplementation since nearly 25% of childbearing age females do not get the recommended amount of iron from their diet and 11% have iron deficiency anemia.¹⁵ Previous studies at Keesler Air Force Base corroborate these findings in a military setting.¹⁶ It should be noted that a significant percentage of active duty military members meet the “at risk” criteria for iron deficiency and are possibly taking iron supplementation. For example, in February 2013, approximately 19% of all active duty Air Force members were females of child bearing age.¹⁷ Coadministration of ferrous sulfate with derivatives of tetracycline demonstrated a reduction of up to 90% of doxycycline absorption.¹⁸ In the event doxycycline and iron supplementation are co-administered, adsorption of doxycycline to achieve prophylactic levels is inhibited as well as proper absorption of iron.¹⁸

Similarly, military members may take other nutritional supplements that interfere with doxycycline absorption. In 2008, the Institute of Medicine issued a report entitled “Use of Dietary Supplements by Military Personnel” that reported 34% of enlisted

personnel take multivitamins, 19% take calcium supplements, and 14% take iron supplements.¹⁹ Each of these supplements can interfere with doxycycline absorption when taken concurrently. In the home-station military setting, patients receive current drug information when receiving a prescription,²⁰ but in the deployed setting, prescriptions are given during a more chaotic time in the patient's life. Even in optimal times, the average patient understands no more than 50% of what is prescribed to him/her.²¹ As a result, military personnel may not fully understand the proper way to take doxycycline. To date, there has been no formal evaluation of nutritional supplement intake in conjunction with prescribed doxycycline in a deployed setting. In addition, there has been no formal evaluation of compliance to the instructions of how to take doxycycline properly.

Materials and Methods

Currently, military personnel are provided oral doxycycline tablets and instructed to take the medication once a day for prevention of malaria while deployed in Afghanistan. Previous studies have reported that some military personnel do not take doxycycline as prescribed.¹¹ Additionally in 2013, anecdotal observations by members of the Joint Combat Casualty Research Team demonstrated that some personnel at Bagram Air Field, Afghanistan did not take their prescribed doxycycline for various reasons. Some of the reasons given for doxycycline non-compliance were lack of awareness regarding food and/or vitamin/mineral interactions, special precautions, potential side effects, and methods for efficacious ingestion of doxycycline. It became evident to the research team that non-compliance and lack of awareness about doxycycline was abundant. Thus, current scientific literature as well as anecdotal observations

provided support for conducting this project. The specific purpose of this performance improvement project was to provide the Garrison Commander with baseline information to improve future compliance of proper doxycycline intake among personnel assigned to Bagram Air Field. This project was supported by the Garrison Commander at the Bagram Airfield and approved as a performance improvement project by the Executive Steering Committee of the Joint Combat Casualty Research Team on 27 March 2013. In addition, the information generated by this report should assist medical professionals in Afghanistan to target certain military groups that may be at risk for non-compliance with doxycycline use.

The performance indicators and quality benchmarks for this project were doxycycline compliance and current awareness of food and/or vitamin/mineral interactions, special precautions, potential side effects, and efficacious ingestion of doxycycline. Specifically, this project utilized a one-time self-report “pen & pencil” survey that was offered at public locations to military personnel physically located at Bagram Air Field. Participation in the survey was strictly voluntary and all submitted surveys were anonymous. Completed surveys were deposited into a large manila envelope. The research team collated the surveys and inserted the data into an Access database using only grouped data to ensure no individual survey could be traced back to any individual. The survey instrument (Attachment 1) was developed using National Institute of Health instructional doxycycline patient information (retrieved at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3062442>, 24 March 2013).

Results

A total of 424 military members completed the survey. Summary demographics of those who completed the survey are shown in Tables 1 – 32.

Table 1 – Age Groups of Members Taking Survey

Age Groups- Years	Number Completing Survey
18-21	29
22-30	189
31-40	131
>41	75
Total	424

Table 2 – Gender of Members Taking Survey

Sex	Number Completing Survey
Male	292
Female	132
Total	424

Table 3 – Rank Category of Members Taking Survey

Rank Category	Number Completing Survey
E1-E4	125
E5-E6	144
E7-E9	55
O1-O3	41
O4-O6	46
Warrant Officer	13
Total	46

Table 4 – Enlisted/Officer-Warrant Officer

Type	Number Completing Survey
Enlisted	324
Officer-Warrant Officer	100
Total	424

Table 5 – Branch of Service

Branch	Number Completing Survey
U.S. Army	245
U.S. Air Force	158
U.S. Marine Corps	3
U.S. Navy	18
Total	424

Table 6 – Year of Military Service to Include Guard/Reserve Time

Years of Service	Number Completing Survey
0-5 Years	137
6-10 Years	108
10-15 Years	74
15-20 Years	57
>20 Years	44
Total	420

Table 7 – Marital Status

Status	Number Completing Survey
Married	250
Divorced	36
Single	53
Separated	125
Total	424

Table 8 – Highest Educational Degree

Status	Number Completing Survey
High School Diploma	160
Associate Degree	101
Bachelor Degree	95
Master Degree	49
Doctoral or professional degree	19
Total	424

Table 9 – Duty Status

Status	Number Completing Survey
Active Duty	334
National Guard/Reserve	90
Total	424

Table 10 – Race/Ethnicity

Race/Ethnicity	Number Completing Survey
Black/non-Hispanic	87
Hispanic	53
White/non-Hispanic	249
Asian/Pacific Islander	23
Other	10
Total	422

Table 11 – Months Deployed

Months Deployed	Number Completing Survey
0-3 Months	87
4-6 Months	115
>6 Months	103
Total	405

Table 12 - Working In Medical Capacity

Medical	Number Completing Survey
Yes	85
No	339
Total	424

Table 13 – Doxycycline Prescription

Prescribed Doxycycline?	Number Completing Survey
Yes	409
No	15
Total	424

Table 14 Currently Have Doxycycline Prescription

Currently Have Doxycycline?	Number Completing Survey
Yes	378
No	46
Total	424

Table 15 – When Do You Take Doxycycline

When Taken	Number Completing Survey
Don't take it	100
1-2 Hours Before or After a Meal	60
With A Meal	103
On An Empty Stomach	24
Right Before Bedtime	74
Just Before/ After Meal	58
Total	419

Table 16 – Liquid Taken With Doxycycline

Type Liquid	Number Completing Survey
Milk	21
Water	297
Soft/Sports Drink	16
Diet Drink	2
No Liquid	16
Total	352

Table 17 – Days A Week Doxycycline Taken

Days Taken	Number Completing Survey
0	61
1	9
2	5
3	3
4	4
5	16
6	29
7	249
Total	376

Table 18 – Reason Last Time Doxycycline Not Taken

Reason	Number Completing Survey
Forgot	236
Side Effects	49
Don't Like Pills	18
No Malaria at Bagram	8
Other*	43 total, 23 unique
Total	334

*Some (20) responded with more than one reason

Other Responses for “Reason Last Time Doxycycline Not Taken”

Before I arrived at Bagram
 Different medicine for malaria
 Don't bother

Other Responses for "Reason Last Time Doxycycline Not Taken" (cont)

Fell in sink
Finished the prescription
Frozen winter weather, don't see need. Also instructions say don't take longer than 3 months for Prophylaxis of malaria
Got sick empty stomach
I am concerned it will damage my liver
I don't need it
I have not seen a mosquito yet
I heard it wasn't a preventative medicine and that its given as a "just in case" but isn't going to prevent malaria
Just don't
Before I arrived at Bagram
Just don't take it
Lazy
Made me sick
Makes me feel rotten inside
Medication caused a yeast infection and the medication given to treat the infection wouldn't last
Mission
Never had them
Nightmares/made me sick
Not previously prescribed (note - she checked in separate box it was prescribed)
On mission
Outside the wire patrol without food
Prescribed alternate
Puts me in a funky depressed mood
Ran out
Ran out
Ran out
Sick to my stomach
Side effects
Side effects - weird dreams
Side effects, got nausea/sick
Sometime throw up
Sometimes they make me throw up
Started taking doxy 1 Mar 13, waiting for start of season (temp above 50-60 F)
TDY
The day off, usually takes it with all employees at same time
The only time I ever get sick is when the military forces meds or vaccines on me
Threw up
Traveling
Waiting for symptoms

Other Responses for “Reason Last Time Doxycycline Not Taken”(cont)

Was on mission and didn't take it with
Was told not necessary until March

Table 19 –Side Effects of Doxycycline That Member Has Heard Of

Side Effects That Member Has Heard Of	Number Completing Survey
None	109
Nausea	47
Diarrhea	114
Soft Stool	58
Vomiting	116
Upset Stomach	247
Skin Rash/Itching	62
Loss of Appetite	58
Yeast Infection	37
Extreme Tiredness/Weakness	60
Confusion	47
Other	76

Other responses to “Side Effects of Doxycycline That Member Has Heard Of”

Affected Dreams
Bad And Vivid Dreams
Bad Dreams
Bad Dreams
Bad Dreams
Bad Dreams
Bad Dreams
Bad Dreams
Bad Dreams
Constipation
Cool Dreams
Crazy Dreams
Crazy Dreams
Crazy Dreams
Crazy Dreams/Vivid
Difficulty Starting To Urinate
Dreams
Dreams

Other responses to “Side Effects of Doxycycline That Member Has Heard Of”(cont)

Feel High
Gas, Bloating
Hallucinations
Having Nightmares
Headache
Headaches
Headaches
Light Sensitive
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares
Nightmares/Weird Dreams
Odd Dreams
Vivid Dreams, Depression
Sensitive to Sunlight
Sensitivity to Sunlight
Sleep Issues
Sleep Walking And Hallucinations
Stinking Urine
Strange Dreams
Strange Dreams
Strange Dreams
Sun Sensitivity
Sunburn
Sunburn Easy
Suns Sensitivity
Vivid Dreams
Vivid Dreams
Vivid Dreams
Vivid Dreams
Vivid Dreams
Vivid Dreams
Vivid Dreams - Blue Capsules
Vivid Dreams, Decrease Effect Of BCP, Sunburn
Vivid Dreams, Nightmares
Vivid Dreams/Heartburn

Other responses to “Side Effects of Doxycycline That Member Has Heard Of”(cont)

Vivid Nightmares
 Weird
 Weird Dreams
 Weird Dreams
 Weird Dreams
 Weird Dreams
 Weird Dreams
 Weird Dreams
 Weird Dreams
 Weird Dreams
 Weird Dreams and Headaches
 "Weird Dreams "Malaria Dream"

Table 20 – Self-Reported Side Effects of Doxycycline

Self-Reported Side Effect	Number Completing Survey
None	91
Nausea	153
Diarrhea	33
Soft Stool	24
Vomiting	41
Upset Stomach	134
Skin Rash/Itching	21
Loss of Appetite	22
Yeast Infection	15
Extreme Tiredness/Weakness	34
Confusion	12
Other*	69

Other responses to “Self-Reported Side Effects of Doxycycline”

Bad Dreams
 Birth Control Less Effective
 Can't Sleep
 Cheat Pain and Lump In Throat (Gastritis)
 Clear Dreams All Night
 Confusion at Night Only
 Constipation
 "Cool Dreams, ""Vaginal"" Itching"
 Crazy Dreams

Other responses to “Self-Reported Side Effects of Doxycycline”(cont)

Difficulty Starting To Urinate

Dreams

Dreams

Dreams

Dreams

Dreams

Dreams Very Vivid

Feel High

First Couple Of Times Only Upset Stomach

Flush/Red Face/Sun Sensitivity

Funky Depressive Mood

Gas, Bloating

Hallucinate At Night

Headache

Headaches

Headaches

Heart Burn, Bad Dreams

Heartburn

Heartburn

Heartburn, Constipation

I Don't Take For No Dam Reason

If I Do Not Eat Before Taking

If No Food Taken, Nausea

In Past With Blue Capsules

Light Sensitive

Malaria Dream

Night Terrors/Confusion

Nightmares

Nightmares

Nightmares

Nightmares

Nightmares

Nightmares

Nightmares

Nightmares If I Skip A Day

Nightmares!!!

Nightmares, Fever

No Sleep From Dreaming

None Sadly (note this individual was told they would have hallucinations)

Not Sleeping

Odd Dreams

Physically Felt Harm And Felt Like I Took Astim (last word unknown)

Scary Nightmares

Skin Sensitivity

Slight Fatigue

Other responses to “Self-Reported Side Effects of Doxycycline”(cont)

Slight Headaches
Strange Dreams
Strange Dreams
Strange Dreams
Sunburn Easy
Vagina Itch
Vivid Dreams
Vivid Dreams
Vomiting Blood After Prolonged Usage
Wake Up At Night With Funny Dreams And Scared
Weird Dreams
Weird Dreams
Weird Dreams
Weird Dreams
Weird Dreams
White Discharge From Vagina

Table 20 – If Side Effects Experienced, Have You Talked To Healthcare Provider?

Talked To Healthcare Provider?	Number Completing Survey
Yes	32
No	218

Table 21 – Has a Peer Ever Recommended Not Taking Doxycycline?

Talked To Healthcare Provider?	Number Completing Survey
Yes	151
No	273
Total	424

Table 22 – Have You Ever Recommended Not Taking Doxycycline?

Talked To Healthcare Provider?	Number Completing Survey
Yes	39
No	385
Total	424

Table 23 – Did Your Leadership Talk To You About The Importance of Taking Doxycycline?

Did Leadership Discuss Importance of Taking Doxycycline	Number Completing Survey
Yes	320
No	104
Total	424

Table 24 – Do You Take Multi-Vitamins?

Frequency of Multi-Vitamin Intake	Number Completing Survey
Everyday	170
Most Days	61
Some Days	37
Seldom	45
Never	106
Total	419

Table 25 – Components of Multi-Vitamins For Those Who Take Every, Most, or Some Days

Frequency of Multi-Vitamin Intake	Yes	No
Iron	189	79
Calcium	195	73
Aluminum	104	164
Zinc	153	115
Magnesium	134	134
Don't Know	57	211

Table 26 – Intake of Individual Supplements?

Intake of Supplements?	Yes	No
Iron	106	318
Calcium	117	307
Antacid	47	277

Table 27 – Do You Take Vitamins, Iron, Calcium, Antacids with Doxycycline (same time)?

Frequency of Supplement With Doxycycline	Number Completing Survey
Everyday	83
Most Days	24
Some Days	41
Seldom	31

Table 28 – Do You Smoke?

Smoking Frequency	Number Completing Survey
Everyday	60
Most Days	11
Some Days	19
Rarely	53
Never	277
Total	420

Table 29– Do You Use Smokeless Tobacco?

Smokeless Tobacco Use	Number Completing Survey
Everyday	26
Most Days	9
Some Days	10
Rarely	18
Never	353
Total	416

Table 30 – Self-Reported Fitness Level (1-10 Scale)

Fitness Level	Number Completing Survey
10	52
9	48
8	145
7	108
6	33
5	14
4	3
3	3
2	0
1	2
Total	408

Table 31–Aware that Doxycycline could make oral contraceptives less effective?

Aware	Number Completing Survey
Yes	97
No	327
Total	424

Table 32–Do You Use Prescribed Oral Contraceptives?

Use Prescribed Oral Contraceptives	Number Completing Survey
Yes	39
No	93
Total	132

Discussion

The overall objective of this process improvement project was to collect and provide baseline information on doxycycline compliance for the Garrison Commander of Bagram Air Field. This information may not only provide useful information to the current Emergency Management Staff at Bagram Air Field, but to other healthcare providers in theater and future researchers as well. While no one hypothesis was proposed prospectively, the research team was interested in the general nature of doxycycline compliance, and particularly whether individuals in theater take their medication properly. This idea is reinforced by reports of up to 56% non-compliance with the prescribed doxycycline regimen in other military studies.¹¹ Bagram Air Field was determined to be an optimum place to obtain baseline information due to its large multiservice population and garrison-like environment.

The most important observation from this dataset is the relative doxycycline non-compliance among service members deployed to Bagram Air Field. A mere 7% of respondents took the medication as prescribed. Specifically, to be considered optimal intake, the medication was taken every day, on an empty stomach one to two hours before/after a meal, taken with water, not taken with vitamins/minerals, and not taken immediately before an extended sleep. Analysis of the data reveals several potential reasons for this low compliance rate and supports the notion that more studies are required to fully examine why noncompliance occurs. First, not all individuals reported being prescribed doxycycline before deployment. Approximately one in twenty five respondents reported having deployed with no prescription for doxycycline. In addition, only 89 % of respondents reported currently having doxycycline on hand.

Regardless of administration compliance, only 59 % of respondents reported taking doxycycline every day. The lack of daily intake in this military population points toward inadequate information, forgetfulness, and/or lack of motivation and internalization of reasons for taking the medication. Project data supports the proposition that inadequate information may be a contributing factor. Results demonstrated that a paltry 75% of respondents reported that their “leadership” ever mentioned the importance of taking doxycycline. In this survey, 71% of “leadership” defined as E7-E9 and O4-O6 reported taking doxycycline everyday vs. 54% for enlisted in ranks E1-E6. This is statistically significant ($p=0.005$, Chi Square with Yates correction). The relatively high compliance rate among “leadership” in relation to enlisted members (E1-E6) could represent a disconnect between leadership knowledge and leadership dispersement of information. Of enlisted members who reported taking doxycycline, their leadership discussed the importance of taking medication 82% of the time. This is in contrast to enlisted members who did not take the medication everyday who reported a 63% rate of leadership encouragement ($p=0.0005$, Chi Square with Yates correction). These statistically significant results highlight the need for leadership involvement in ensuring medication compliance.

Gender is a variable that was also shown to be important. Of those who reported taking doxycycline greater than once per week, females demonstrated a statistically higher probability of taking multi-vitamins than males (65% vs. 50%, $p=0.02$, Chi Square with Yates correction). Approximately 34% of females and 28% of males taking multi-vitamins greater than once per week took these supplements concurrently with doxycycline. This co-administration of supplements with doxycycline is contrary to prescription directions and can lead to decreased absorption of doxycycline.

Perhaps the most intriguing observation was the side effects noted by the respondents. It was expected, based on the large number of side effects associated with doxycycline, that members would self-report side effects. Respondents had ten different side effects to choose from when completing the survey. Nearly 54% of respondents reported having some side effect(s). A striking 67% of females reported side effects vs. 47% of males ($p=0.0001$, Chi Square with Yates correction). Nausea and upset stomach were the two most common complaints. Respondents were also allowed to “write in” other side effects they experienced. Surprisingly, 6% of respondents noted “bad and vivid dreams, nightmare, terrors, etc...”. In addition, many other respondents reported feeling high, funky depressions, hallucinations, and headaches. While certainly some of these reports may be attributed to service members hearing about some of these side effects commonly reported for a different anti-malaria drug (mefloquine), the volume of responses regarding this topic and doxycycline strongly suggest future research. A complete listing of self-reported side effects and those reported by peers are shown in Table 19 and Table 20. It should be noted that survey administration was performed using a convenience sample and all results could be biased by this methodology and not representative of the entire population of U.S. service members.

Conclusion

Doxycycline compliance is an essential medical consideration for Commanders and medical personnel in the deployed environment. In current and previous conflicts in malaria endemic areas, malarial infection is a detriment to military personnel's health and consequently mission success. It is well known that no matter how efficacious a countermeasure for malarial infection may be, personal failure to comply with medication administration negates its effectiveness. This performance improvement project demonstrated that doxycycline compliance was less than optimal at Bagram Air Field. In addition, this project highlights the need for continued exploration and research to improve doxycycline compliance among military personnel.

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Attachment

Malaria Medication Survey

This survey is about a malaria prevention medication called Doxycycline. If you are a U.S. Military member at Bagram and taking Doxycycline for malaria prevention, you are eligible to take this survey. The survey assesses compliance & awareness about it. Participation's voluntary and strictly confidential. No identifying information is asked. Your participation is helpful appreciated.

1. Please answer the following questions about yourself:

- a) Age Group: 18-21 ☐ 22-30 ☐ 31-40 ☐ 41 or older ☐
- b) Sex: Male ☐ Female ☐
- c) Rank Category: E1-E4 ☐ E5-E6 ☐ E7-E9 ☐ O1-O3 ☐ O4-O6 ☐ WO ☐
- d) Years In The Military (*including time in Reserve/National Guard*): _____
- e) Marital Status (check one): Single ☐ Married ☐ Divorced ☐ Separated ☐
- f) Highest Educational Degree (check one): High School ☐
Diploma ☐ Associate's ☐ Bachelor's ☐ Master's ☐ Doctoral or professional degree ☐
- g) Current Status When Not Deployed: Active Duty ☐ Guard/Reserve ☐
- h) Branch of Service: USA ☐ USN ☐ USMC ☐ USAF ☐
- i) Race/Ethnicity: Black/non-Hispanic ☐ Hispanic ☐ White/non-Hispanic ☐
Asian/Pacific Islander ☐ Other ☐
- j) With This Deployment, How Many Months Have You Been In Afghanistan?
_____ months
- k) Are You Working In A Medical Capacity While Deployed? Yes ☐ No ☐

2. Were you prescribed Doxycycline to prevent Malaria? Yes ☐ No ☐

- a) Do You Currently Have Doxycycline? Yes ☐ No ☐
- b) When Do You Take This Medication? Don't take it ☐ 1-2 Hours Before or After a Meal ☐ With A Meal ☐ On An Empty Stomach ☐ Right Before Bedtime ☐ Just Before

or After a Meal ☐

c) **Do You Take Medication With:** Milk ☐ Water ☐ Sports Soft/ Drink ☐ Diet Soft Drink ☐ No Liquid ☐

d) **On Average, How Many Days A Week Do You Take Your Doxycycline?** _____ days/week

e) **The Last Time You DID NOT take Doxycycline, What Was The Reason?**

Forgot ☐ Side Effects ☐ Ran Out of Pills ☐ There's No Malaria at Bagram ☐

Don't Like Pills ☐

OTHER: _____

f) **What Side Effects Related To Doxycycline have you heard about? (✓ all that apply):**

Nausea ☐ Diarrhea ☐ Soft Stool ☐ Vomiting ☐ Upset Stomach ☐ Skin

Rash/Itching ☐ Loss of Appetite ☐ Yeast Infection ☐

Extreme Tiredness/Weakness ☐ Confusion ☐

OTHER: _____

g) **What Side Effects Have You Experienced Related To Taking Doxycycline? (✓ all that apply):**

None ☐ Nausea ☐ Diarrhea ☐ Soft Stool ☐ Vomiting ☐ Upset Stomach ☐ Skin

Rash/Itching ☐ Loss of Appetite ☐ Yeast Infection ☐

Extreme Tiredness/Weakness ☐ Confusion ☐

OTHER: _____

h) **If You Experienced Side Effects, Have You Talked To A Medical Provider?**

Yes ☐ No ☐

i) **Has A Peer Ever Recommended NOT taking Doxycycline?** Yes ☐ No ☐

j) **Have You Ever Recommended NOT taking Doxycycline?** Yes ☐ No ☐

k) Did Your Leadership Talk To You About The Importance of Taking Doxycycline? Yes ☐ No ☐

3. Do You Take Multivitamins? Everyday ☐ Most Days ☐ Some Days ☐ Seldom ☐ Never ☐

a) Does the Vitamin Contain (✓ all that apply): Iron ☐ Calcium ☐ Aluminum ☐ Zinc ☐
Magnesium ☐
Don't Know ☐

b) Do You Take Iron Yes ☐ No ☐ Calcium Yes ☐ No ☐ Antacids Yes ☐ No ☐

c) Do You Take Vitamins, Iron, Calcium, Antacids with your Doxycycline (at the same time)?

Everyday ☐ Most Days ☐ Some Days ☐ Seldom ☐ Never ☐

4. Do You Smoke?: Daily ☐ Most Days ☐ Sometimes ☐ Rarely ☐ Never ☐

5. Do You Use Smokeless Tobacco?: Daily ☐ Most Days ☐ Sometimes ☐ Rarely ☐
Never ☐

6. Compared With Your Peers, On A Scale of 1 to 10, rate YOUR own fitness level: _____

7. Were you aware that Doxycycline could make oral contraceptives less effective? Yes ☐
No ☐

8. (Females Only) Do You Use Prescribed Oral Contraceptives?: Yes ☐ No ☐

This effort was approved by the Garrison Commander, Bagram Airfield and certified and approved as a performance improvement project by the Executive Steering Committee of the Joint Combat Casualty Research Team on 27 March 2013.